FIG.1

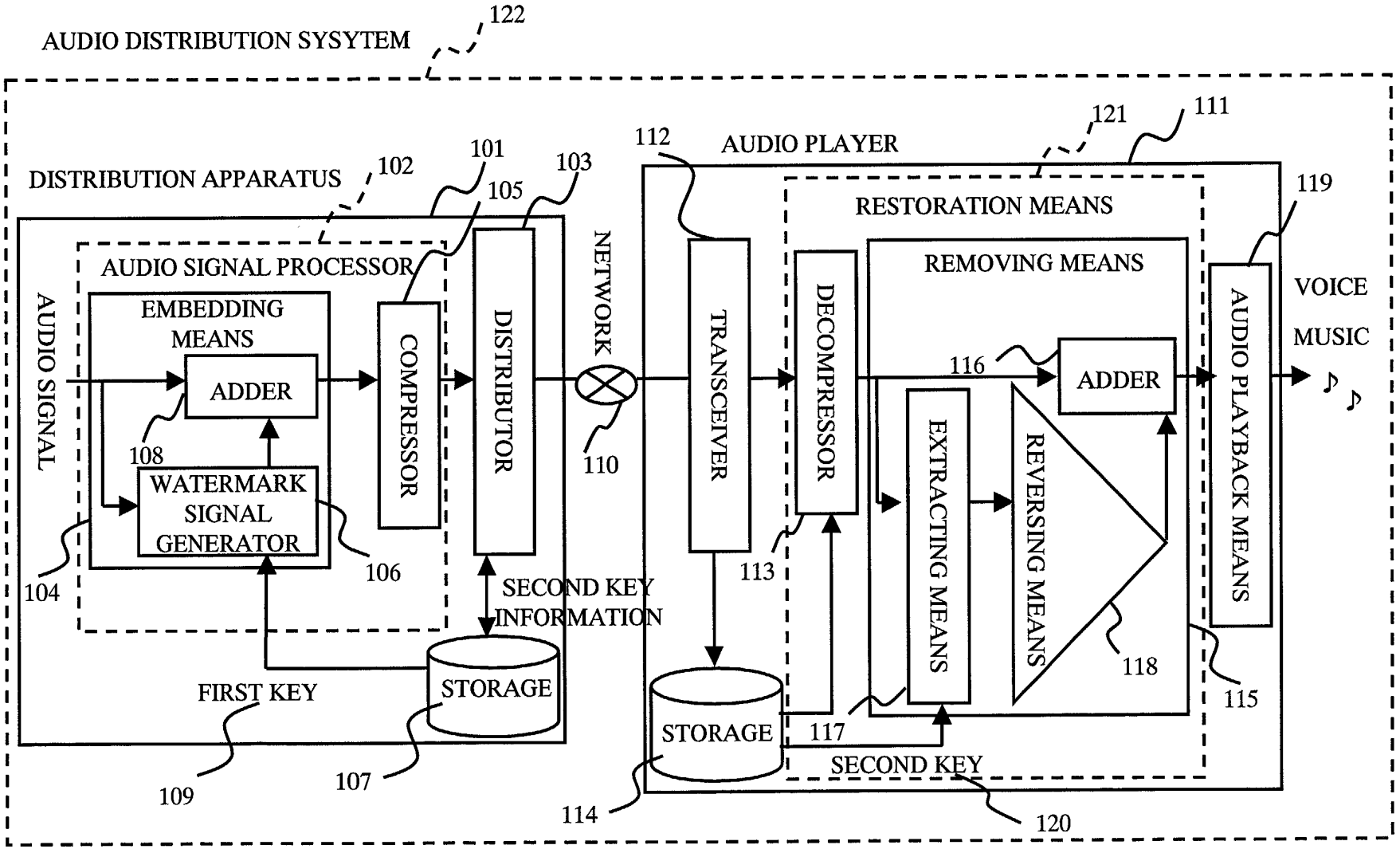

AUDIO DISTRIBUTION SYSYTEM
122
DISTRIBUTION APPARATUS
102
101
103
105
AUDIO SIGNAL PROCESSOR
AUDIO SIGNAL
EMBEDDING MEANS
ADDER
108
WATERMARK SIGNAL GENERATOR
104
106
COMPRESSOR
DISTRIBUTOR
SECOND KEY INFORMATION
FIRST KEY
STORAGE
109
107
NETWORK
110
112
AUDIO PLAYER
121
111
RESTORATION MEANS
119
TRANSCEIVER
DECOMPRESSOR
113
REMOVING MEANS
116
ADDER
EXTRACTING MEANS
REVERSING MEANS
118
AUDIO PLAYBACK MEANS
115
VOICE
MUSIC
STORAGE
114
117
SECOND KEY
120

FIG.2

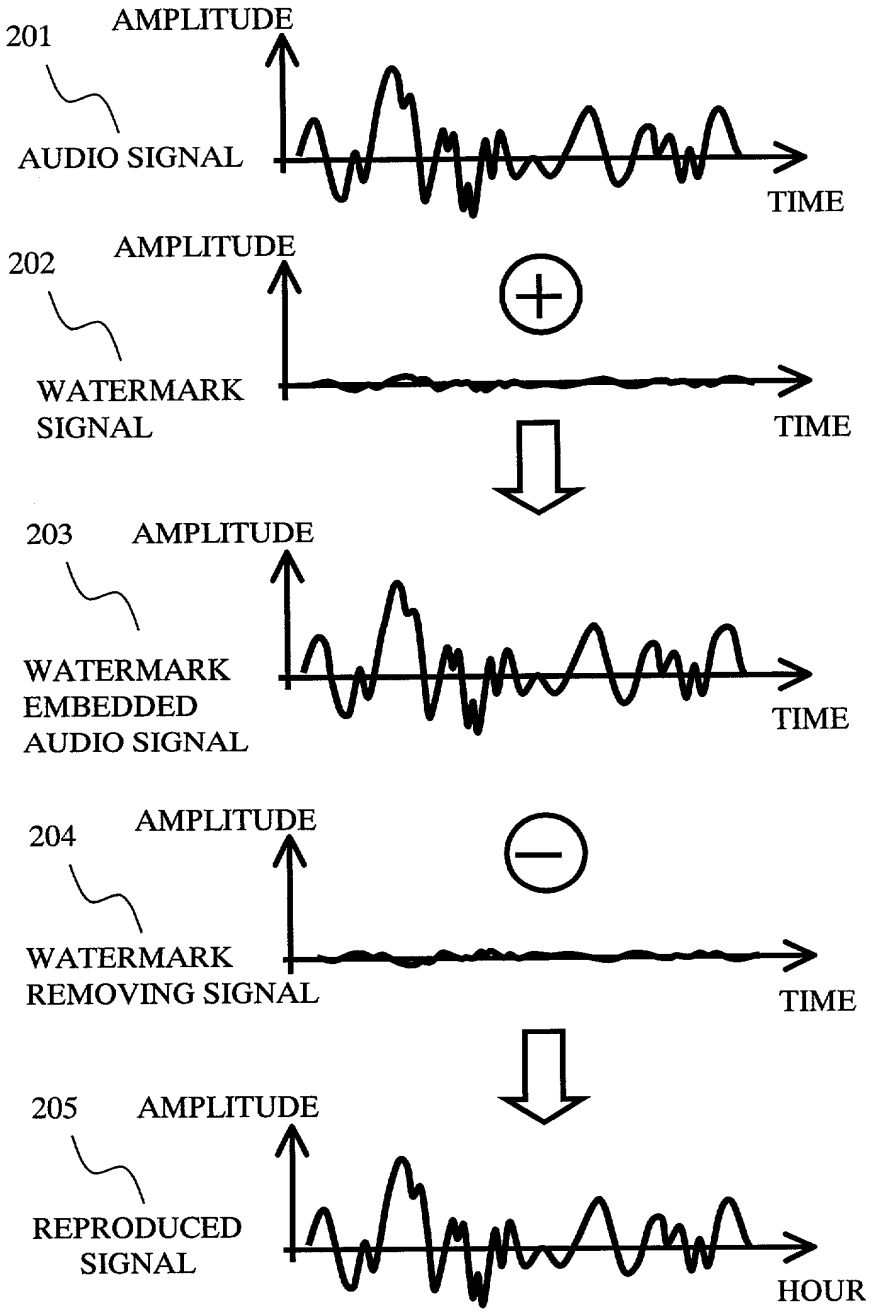

201
AMPLITUDE
AUDIO SIGNAL
TIME
202
AMPLITUDE
WATERMARK
SIGNAL
TIME
203
AMPLITUDE
WATERMARK
EMBEDDED
AUDIO SIGNAL
TIME
204
AMPLITUDE
WATERMARK
REMOVING SIGNAL
TIME
205
AMPLITUDE
REPRODUCED
SIGNAL
HOUR

FIG.3

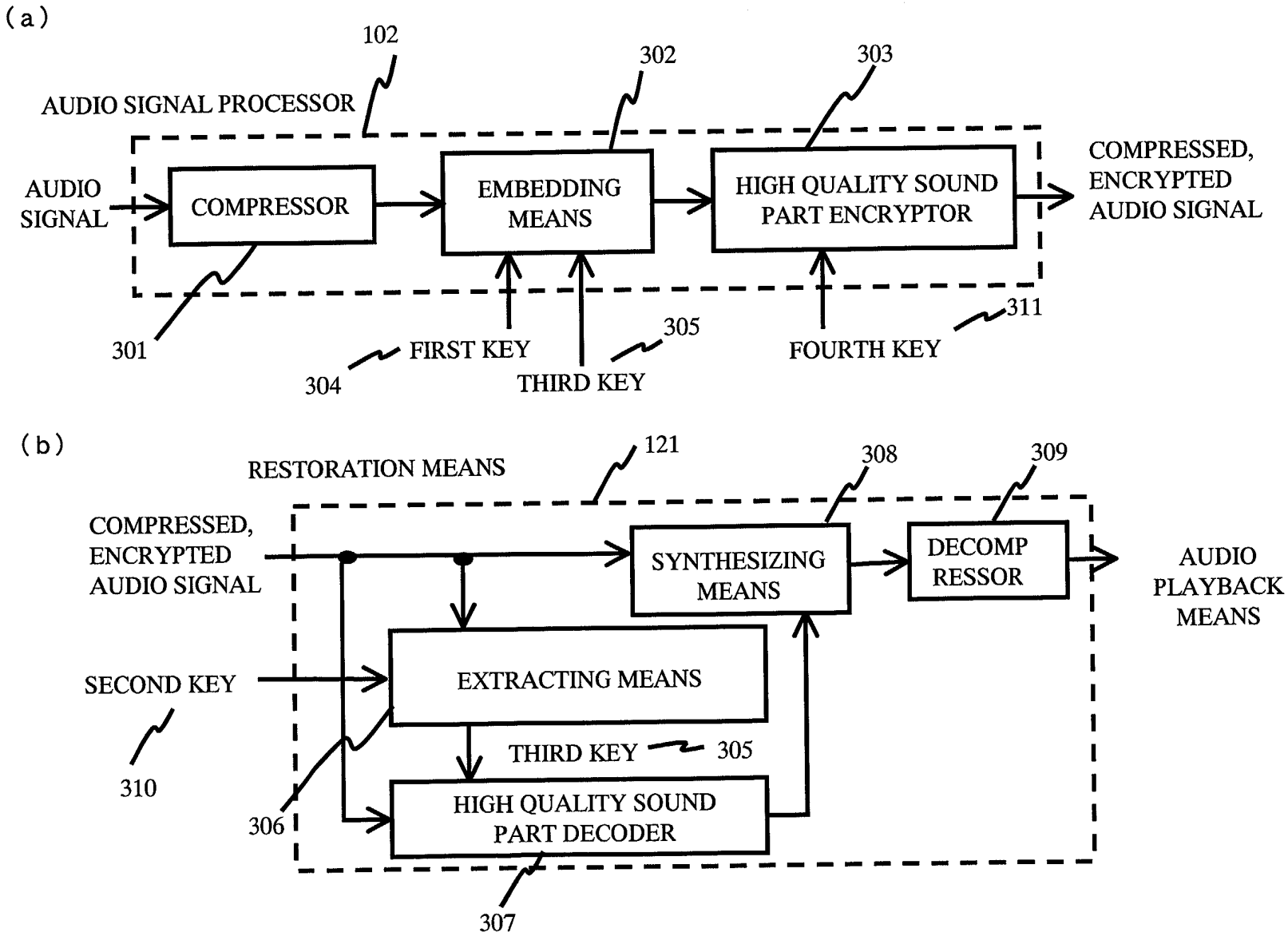

(a)
102
AUDIO SIGNAL PROCESSOR
302
303
AUDIO SIGNAL
COMPRESSOR
EMBEDDING MEANS
HIGH QUALITY SOUND PART ENCRYPTOR
COMPRESSED, ENCRYPTED AUDIO SIGNAL
301
304
FIRST KEY
305
THIRD KEY
FOURTH KEY
311
(b)
121
RESTORATION MEANS
308
309
COMPRESSED, ENCRYPTED AUDIO SIGNAL
SYNTHESIZING MEANS
DECOMP RESSOR
AUDIO PLAYBACK MEANS
SECOND KEY
EXTRACTING MEANS
310
THIRD KEY
305
306
HIGH QUALITY SOUND PART DECODER
307

FIG.4

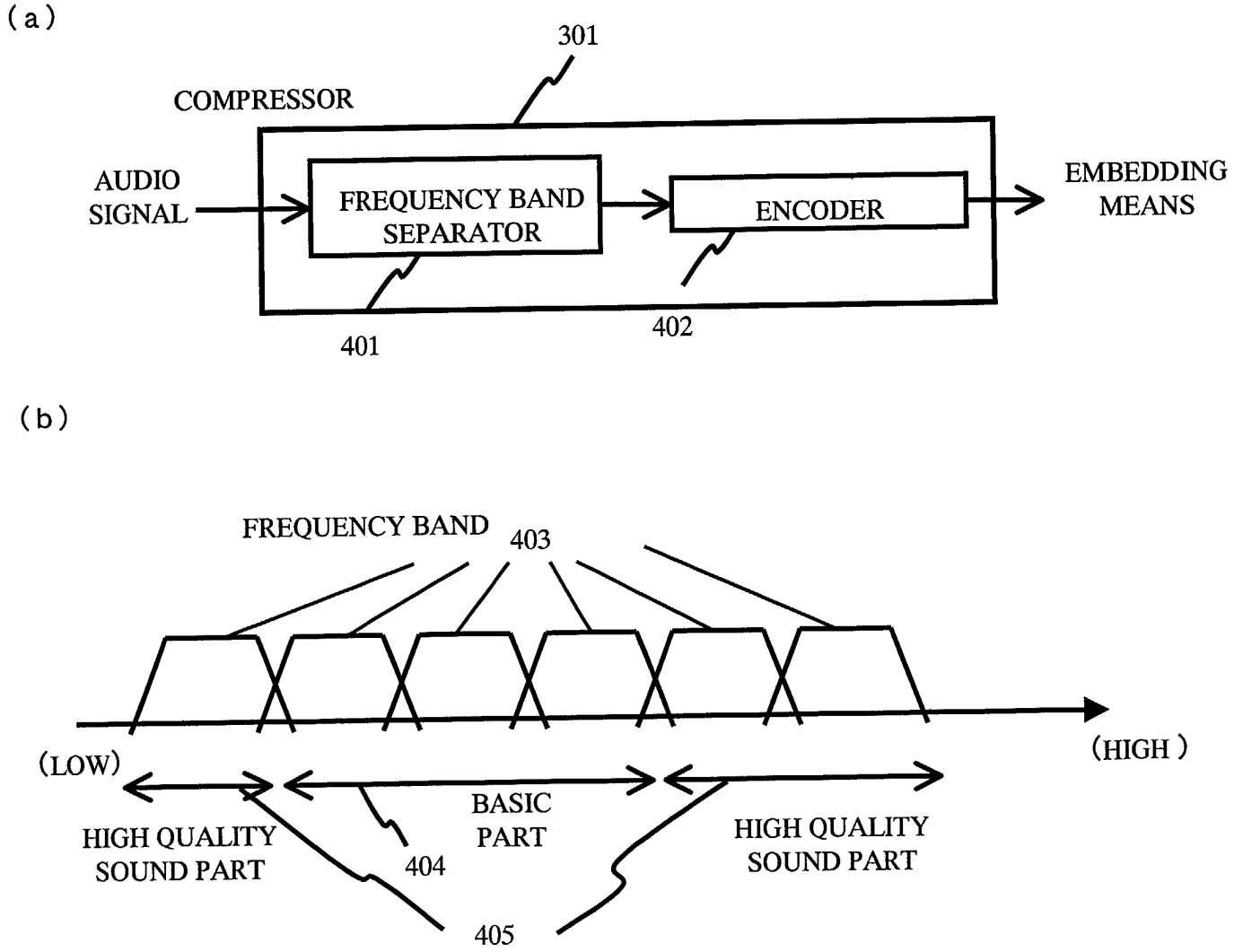

(a)
301
COMPRESSOR
AUDIO SIGNAL
FREQUENCY BAND SEPARATOR
ENCODER
EMBEDDING MEANS
401
402
(b)
FREQUENCY BAND
403
(LOW)
(HIGH)
HIGH QUALITY SOUND PART
BASIC PART
HIGH QUALITY SOUND PART
404
405

FIG.5

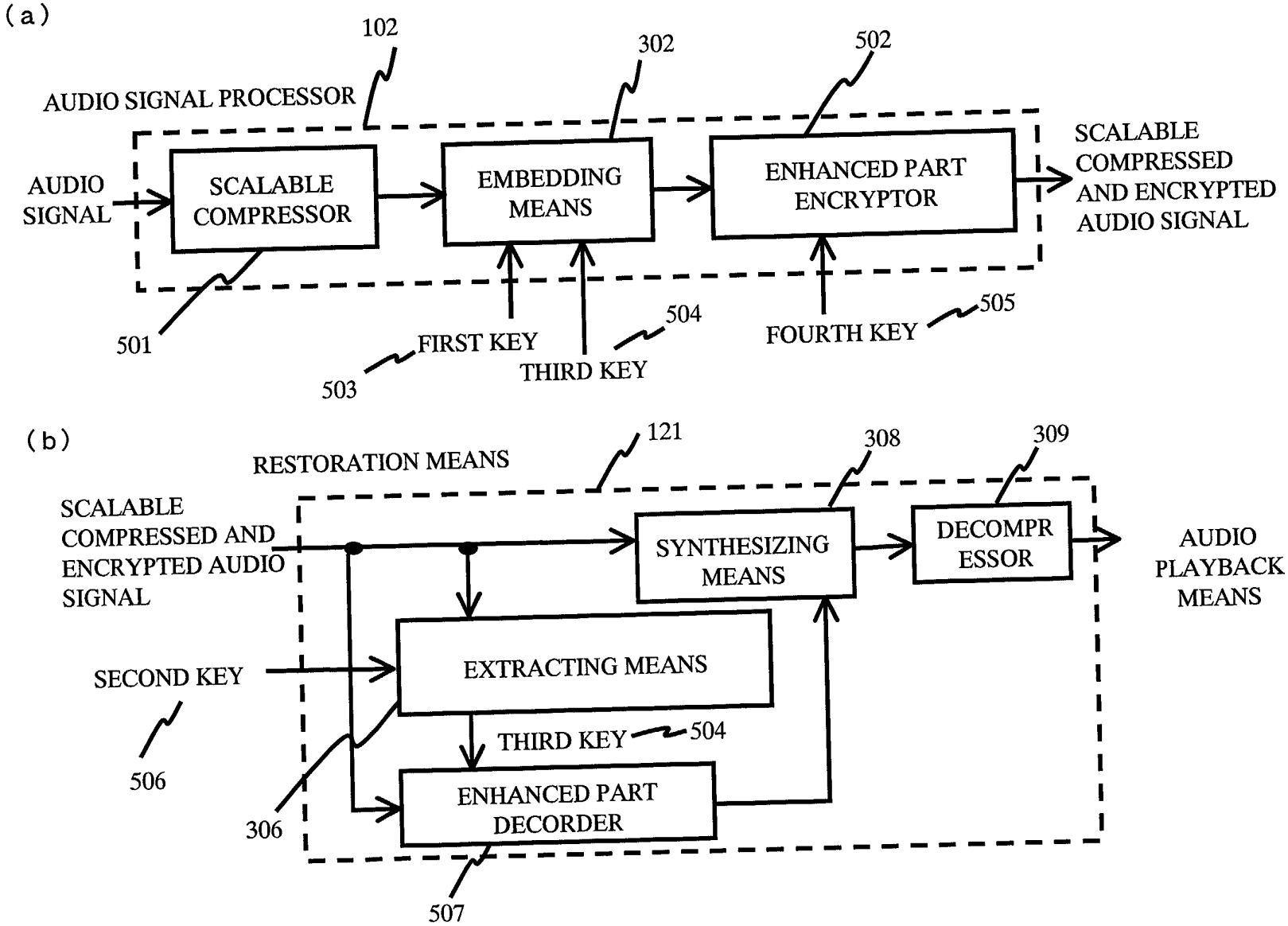

(a)
102
302
502
AUDIO SIGNAL PROCESSOR
AUDIO SIGNAL
SCALABLE COMPRESSOR
EMBEDDING MEANS
ENHANCED PART ENCRYPTOR
SCALABLE COMPRESSED AND ENCRYPTED AUDIO SIGNAL
501
503
FIRST KEY
504
THIRD KEY
505
FOURTH KEY
(b)
121
RESTORATION MEANS
308
309
SCALABLE COMPRESSED AND ENCRYPTED AUDIO SIGNAL
SYNTHESIZING MEANS
DECOMPR ESSOR
AUDIO PLAYBACK MEANS
SECOND KEY
EXTRACTING MEANS
506
THIRD KEY
504
306
ENHANCED PART DECORDER
507

FIG.6

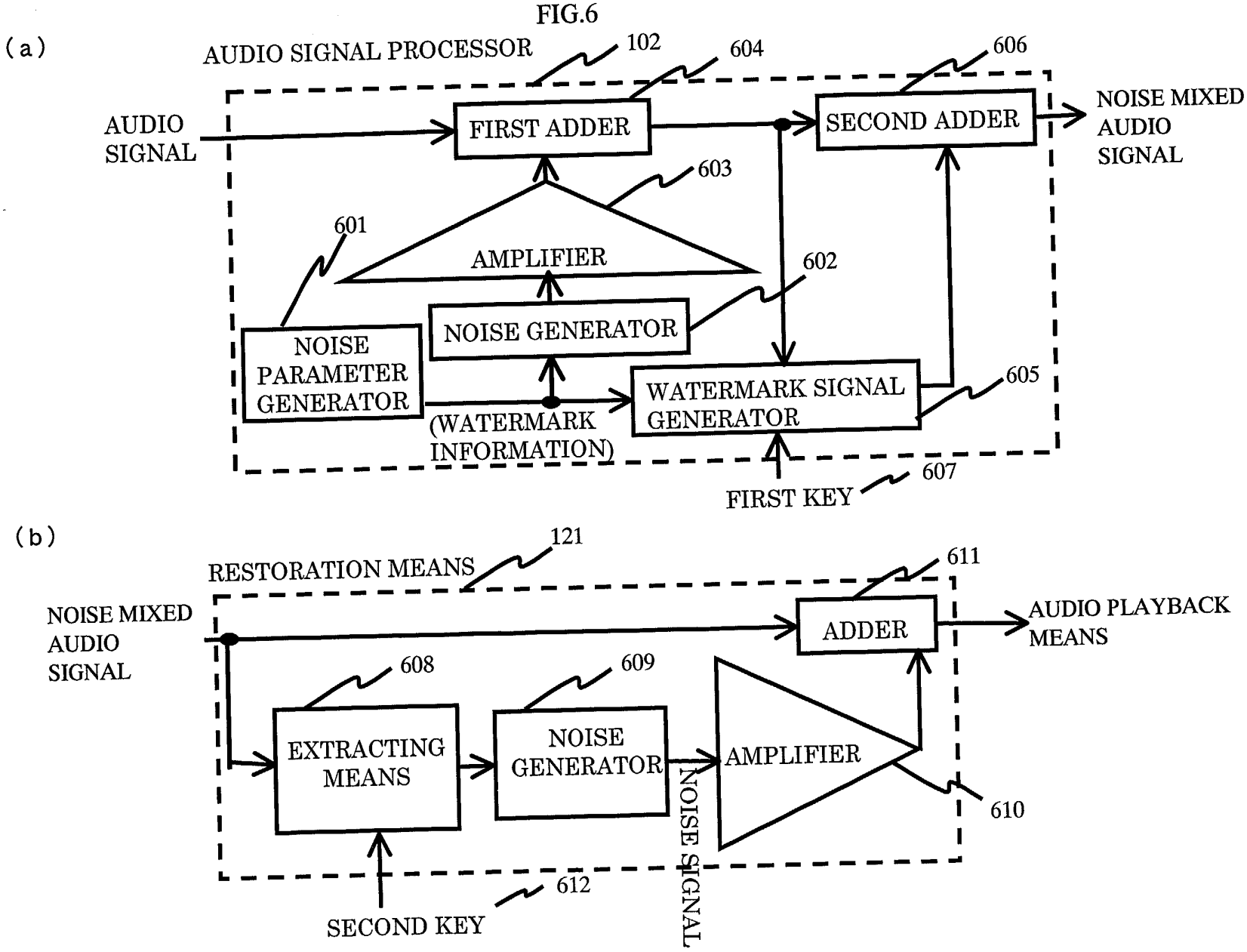
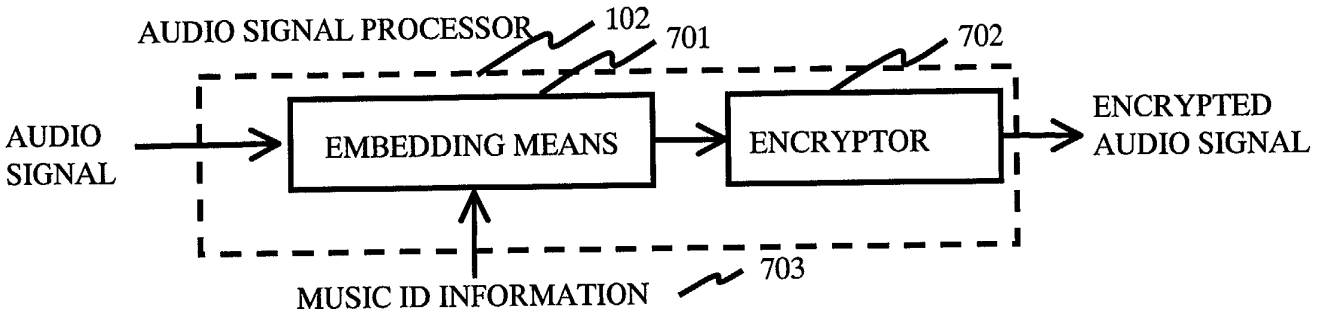

(a)
AUDIO SIGNAL PROCESSOR
102
604
606
AUDIO SIGNAL
FIRST ADDER
SECOND ADDER
NOISE MIXED AUDIO SIGNAL
603
601
AMPLIFIER
602
NOISE GENERATOR
NOISE PARAMETER GENERATOR
WATERMARK SIGNAL GENERATOR
605
(WATERMARK INFORMATION)
FIRST KEY
607
(b)
121
RESTORATION MEANS
611
NOISE MIXED AUDIO SIGNAL
ADDER
AUDIO PLAYBACK MEANS
608
609
EXTRACTING MEANS
NOISE GENERATOR
AMPLIFIER
610
NOISE SIGNAL
612
SECOND KEY

FIG.7

(a)


AUDIO SIGNAL PROCESSOR
102
701
702
AUDIO SIGNAL
EMBEDDING MEANS
ENCRYPTOR
ENCRYPTED AUDIO SIGNAL
MUSIC ID INFORMATION
703

(b)

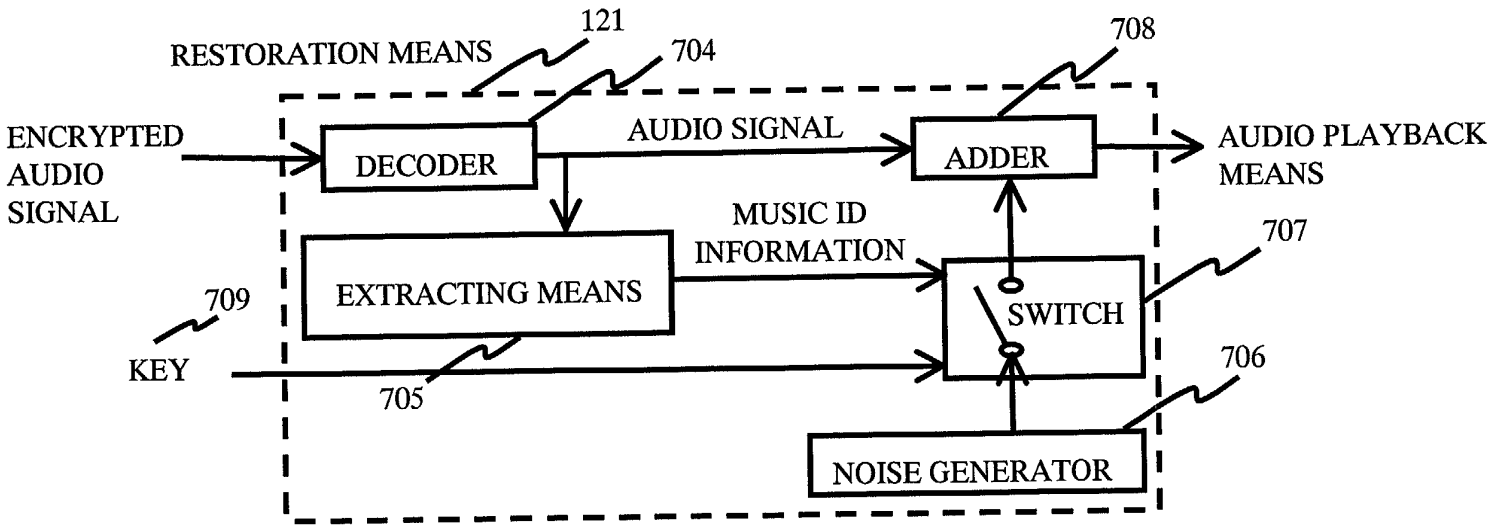

RESTORATION MEANS
121
704
708
ENCRYPTED AUDIO SIGNAL
DECODER
AUDIO SIGNAL
ADDER
AUDIO PLAYBACK MEANS
MUSIC ID INFORMATION
707
EXTRACTING MEANS
709
SWITCH
KEY
705
706
NOISE GENERATOR

FIG.8

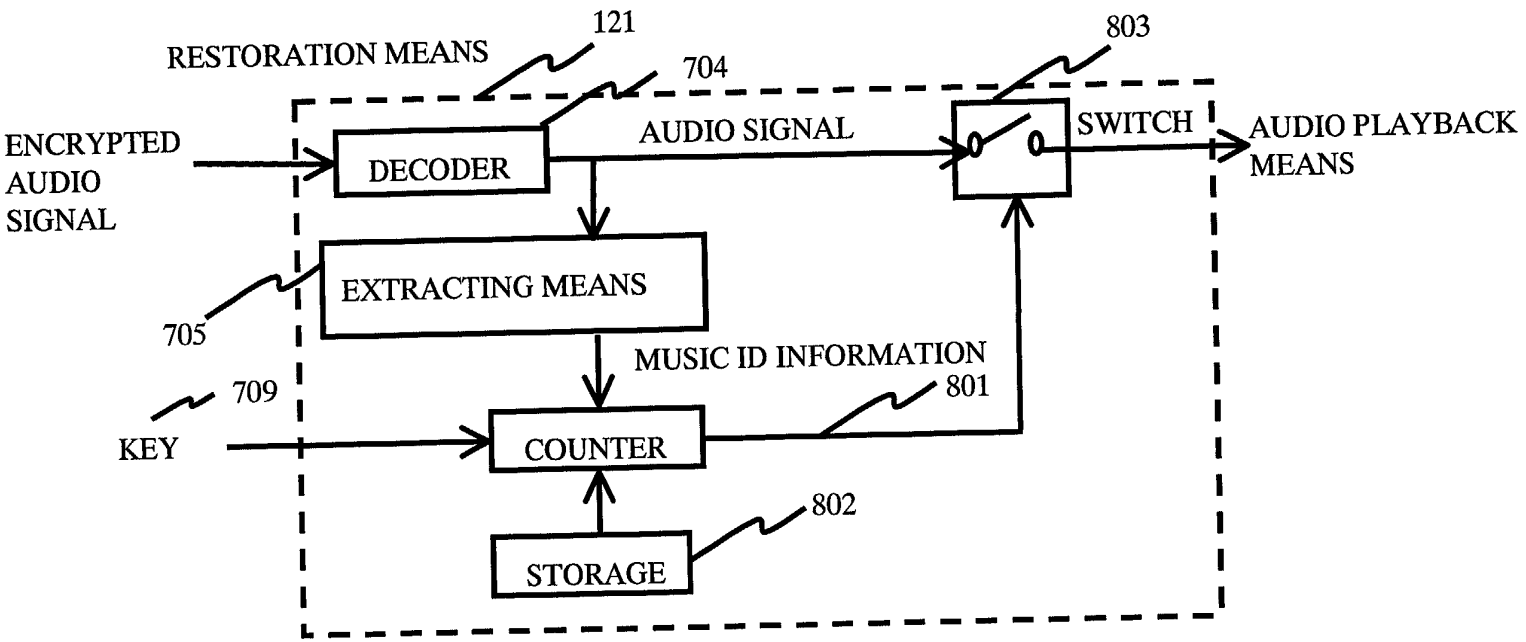

RESTORATION MEANS
121
803
704
ENCRYPTED AUDIO SIGNAL
DECODER
AUDIO SIGNAL
SWITCH
AUDIO PLAYBACK MEANS
EXTRACTING MEANS
705
MUSIC ID INFORMATION
709
801
KEY
COUNTER
802
STORAGE

FIG.9

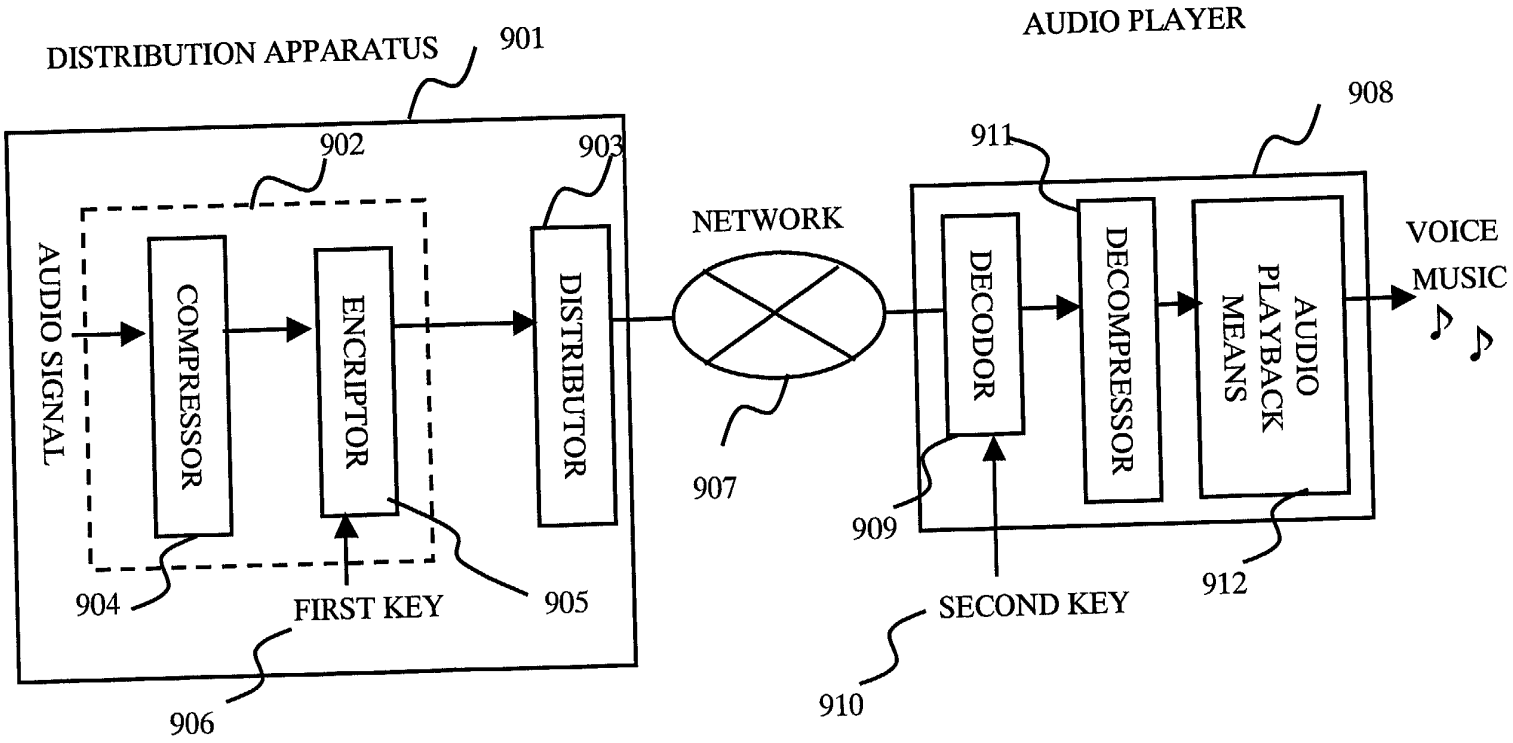

DISTRIBUTION APPARATUS
901
AUDIO PLAYER
908
902
903
911
AUDIO SIGNAL
COMPRESSOR
ENCRIPTOR
DISTRIBUTOR
NETWORK
DECODOR
DECOMPRESSOR
AUDIO PLAYBACK MEANS
VOICE
MUSIC
907
909
904
905
FIRST KEY
SECOND KEY
912
910
906

FIG.10

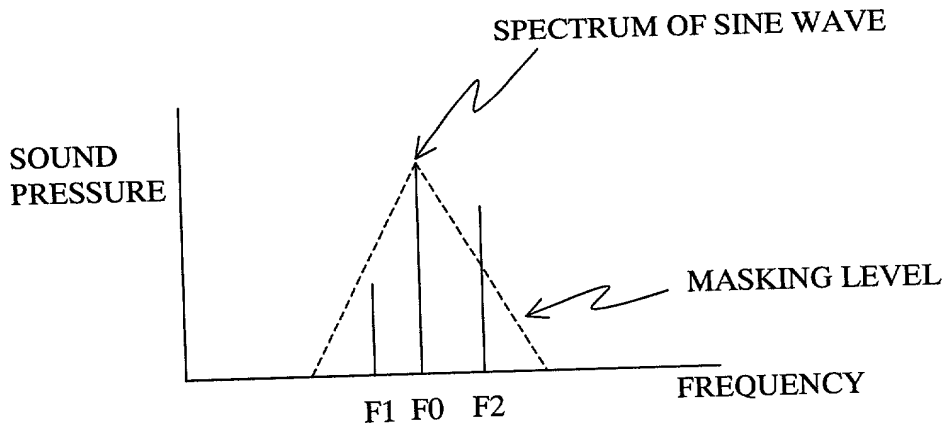
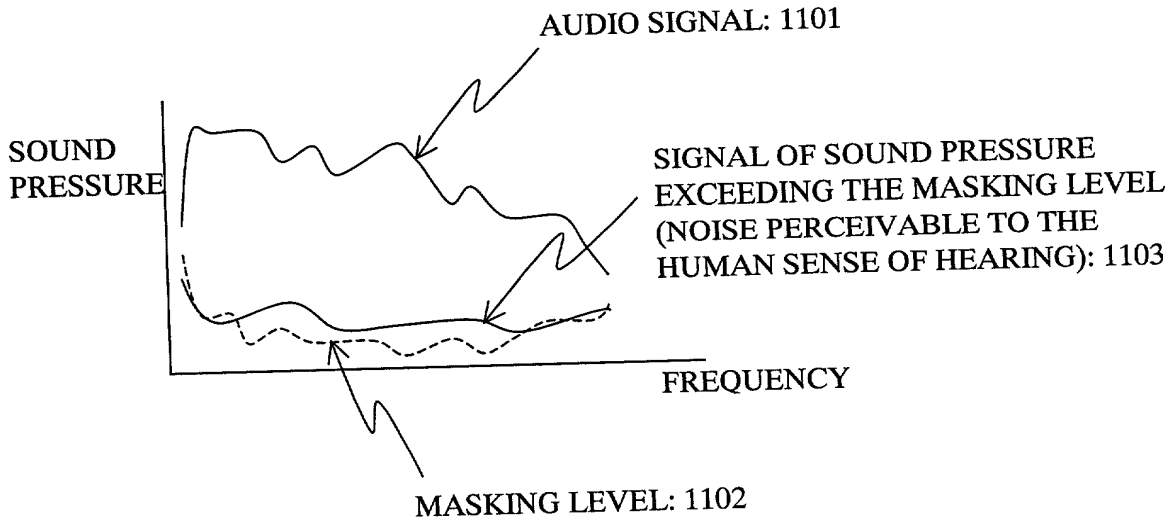

SPECTRUM OF SINE WAVE
SOUND PRESSURE
MASKING LEVEL
FREQUENCY
F1 F0 F2

FIG.11


AUDIO SIGNAL: 1101
SOUND PRESSURE
SIGNAL OF SOUND PRESSURE EXCEEDING THE MASKING LEVEL (NOISE PERCEIVABLE TO THE HUMAN SENSE OF HEARING): 1103
FREQUENCY
MASKING LEVEL: 1102